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ABSTRACT

Individualized learning by distance education is discussed, with examples from Lincoln College, New Zealand. After identifying advantages and disadvantages of this approach for students, five degrees of freedom in learning encompassed by this mode are covered that involve content, method, pace, assessment, and sequence. Freedom of content allows students to choose what they learn within a particular part of the course. Students can also choose the learning methods that they find most suitable, work at their own pace, and learn at times and places that they choose. Students can choose whether or not they are to be assessed, and if so, what form assessment takes. In addition, students can choose in what order they wish to study the material. Individualization requires that the content and the objectives relating to the content be adopted to meet the learner's needs and abilities. A task-based distance education course (Diploma in Agriculture) at Lincoln College uses a learning package. Based on a task-analysis of framing systems, standardized skills specific to each task have been identified. In addition to task-related assessment sheets in the learning packages, students write two farm reports. (SW)

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INDIVIDUALISED LEARNING

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HE 01 P 239

Individualised learning has been defined by Rowntree (1981b) as 'some attempt to tailor the teaching and learning to the individual needs of each learner'. It is the process by which individuals in a group can develop knowledge, attitudes or skills to suit their personal learning needs. Romiszowski (1984) defined it "as the creation of a self-correcting, system of instruction, sensitive to the individual needs and learning difficulties of the target students".

Distance education can open possibilities for study adapted to individual needs, wishes and conditions of each student.

Holberg (1985), quoted Delling (1975, pp 58-59) who questions:

"Whatever gives educational politicians, planners, and educationalists the right to the absolute decision as to how long an educational process may last? ... Why should the learners in distant study not learn according to their own fashion but according to the fashion forced upon them ...?"

Individualised learning has been classified into different classes by Edling (1970) and Romiszowski (1984).

This individualisation classification can be summarised as:

1. Methods and media chosen by the system or learner.
2. Objectives determined by the institution or the learner.
3. Degree of potential individualisation.
4. The levels within a course at which individualisation takes place.
 - (a) At the course level
 - the option to take a course.
 - (b) At the course unit level.
 - (c) At the lesson level
 - pace, sequence, assessment, methods, media, and content.
 - (d) At the learning steps level
 - pace, sequence, assessment, methods, media, and content.

One method of individualisation is the mastery model suggested and developed principally by Bloom (1971) and Carroll (1971). It's major point of difference from traditional learning models is that it does not accept differentiated achievement among students as a necessary consequence of different aptitudes.

Individualised learning by distance education can have advantages and disadvantages for students.

ADVANTAGES:

1. Motivation - it is likely to increase motivation and therefore effort.
2. Flexibility - allows a student to adapt the programme to his/her own learning characteristics and needs in respect to learning strategies, pace, content, and instruction.
3. Co-operation - engenders greater co-operation with the teaching institution by reducing inter-student competition and the threat of failure.
4. Feedback - can provide immediate and continuing feedback.
5. Mastery - potentially all students can master the subject because it is criterion-referenced.
6. Remedial work - allows students to restudy specific subject areas.

DISADVANTAGES:

1. Self discipline - essential to fulfill requirements.
2. Study strategies - not all students like a less rigorous system.
3. Choice - choosing between different options may prove confusing, and frustrating.

Individualised learning has been examined in terms of the degrees of freedom that students are allowed (Boud et al, 1975). They distinguished four degrees of freedom in learning. A fifth degree of freedom - freedom of sequence has also been described.

FIVE DEGREES OF FREEDOM IN LEARNING CAN BE DISTINGUISHED:

1. **Freedom of content** - students can choose **what** they learn within a particular part of the course, or even choose not to work at all on the course provided.
2. **Freedom of method** - students can choose the learning methods that they find most suitable.
3. **Freedom of pace** - students can work at their own pace and learn at times and places that they choose.

4. **Freedom of assessment** - students can choose whether or not they are to be assessed, and if so, what form assessment takes.
5. **Freedom of sequence** - students can choose in what order they wish to study the material.

1. FREEDOM OF CONTENT

Romiszowski (1981) suggests two levels of analysis for instructional design: a subject (the information to be communicated), a job (the tasks to be performed).

The content of a course and the decision about what to teach is discussed in depth by Rowntree (1981a, 1982). Romiszowski (1981) presents a number of approaches to the problem using a systems approach.

Most distance education courses with their various components aim at leading their students to specific goals. The students should be capable of following the exposition, doing the exercises and solving the problems set. Each study unit is seen as an integral part and compulsory component (Holmberg, 1985).

Holmberg suggests that having an all-embracing course structure is often considered too rigid. Students should be given the choice to study those units within a course that are particularly relevant to them.

Individualisation requires the content and the objectives relating to that content be adopted to meet the needs and abilities of the learner.

At one end of the range of options lies 'indoctrination' in which the learners are manipulated to achieve someone else's expectation. At the other end is education - where the students' individual needs and purposes are respected and they are helped to enhance and fulfill their own expectations. Such a spectrum equally may have learner-centred and teacher centred systems at either pole.

Romiszowski's levels are useful in analysing how the Diploma course at Lincoln College serves students needs.

Lincoln College has 500 Diploma in Agriculture students undertaking practical work over a two-year period before entering the College. The students then enter the College for the 8 month period between March and October, (Table 1). During this time they undertake lectures, laboratories and field trips.

In New Zealand, the Agricultural Training Council undertook a task analysis of the dairy, beef, arable and sheep farming systems. Within each farming system farm tasks were used to clarify training needs so that the training could be implemented. Standardised skills specific to each task were identified and standards of performance established. A total of 406 tasks were listed and analysed. One hundred and twenty three of these tasks were classified as advanced tasks.

The students are free to choose any content they wish to study. While at the developmental stage that choice is not as wide as it should be. However it is hoped that given sufficient resources it will offer learning packages for the whole 406 tasks currently on the task lists. Farm forestry, goats, deer, and horticultural tasks are still to be researched using a DACUM procedure.

Having chosen a specific learning package the students may then choose to meet all, some, or none of the objectives and subsequently the content offered to meet those objectives.

Within each objective, unit, or within each task there is less individualisation. The learning steps taken to achieve each objective allows little choice.

Subsequently a Training guide for each task was drawn up. Each guide contains a description of objectives and individual skills. The objectives have three components:

- * conditions
- * performance
- * standards

Each task has an identified knowledge component. These are what Romiszowski calls the hidden element of knowledge necessary to perform certain task elements. These are transformed into an enabling objective.

An enabling objective is one that does not appear in the task analysis as a step or operation but which should be mastered by the learner to enable him to learn certain elements of a task.

TABLE 1 - SEQUENCE OF LEARNING FOR THE DIPLOMA IN AGRICULTURE

	YEAR 1	YEAR 2	YEAR 3
KNOWLEDGE	FARM-BASED KNOWLEDGE		HUSBANDRY AND MANAGEMENT KNOWLEDGE
SKILLS	FARM-TASKED BASED SKILLS		COGNITIVE SKILLS

The generalised progression of learning is shown in Table 1. During Year 1 and Year 2 the College supplies learning packages to meet the 406 tasks documented in the Task Analysis. Ultimately each student will be able to choose in total 90 tasks from the 283 Stage I and 123 Stage II tasks drawn up.

Most learning packages consist of about 6 tasks. Students can choose to do none in a learning package or one or more of the six.

The Diploma course learning packages enable students to choose their own sequence of study.

The packages have:

- * Objectives at the beginning, at the top of each unit or topic within the package, and again with the assessment questions.
- * Table of contents.
- * Access structures - headings, adjunct and embedded questions

A recent evaluation of a College learning package reinforced the work of Clyde et al (1983). Some students either ignore or surface level process introductory sections that don't relate directly to assessment.

Students may receive alternative lesson content, as a means of tailoring a course to an individual's selected objectives.

2. FREEDOM OF METHOD

Morgan et al (1980) noted that "even after almost ten years evaluating courses we know relatively little about how students handle our learning materials". The work of the James Cook University (see Clyde et al, 1983) has been pioneering in this aspect. Their work suggests that the study 'pathways' of students (the order in which students tackle part of the study package), is not what course writers expected.

Marton and Saljo (1976) as a result of interviews with students on completion of a learning task, distinguish between what they call 'surface-level' and 'deep-level' processing.

Marland et al, (1984) have been undertaking research into learning from distance-teaching materials. Their initial work provides interesting and important glimpses into the study strategies of a small group of students. The study was based on the mediating process paradigm which focuses attention on the mental processes that mediate or come between instructional states and learning outcomes.

The part that individualisation of students' study programmes may play in the mediating process and learning outcome is important. If it will motivate and stimulate the student to engage in deep level processing rather than surface level processing then the quality of learning will be enhanced.

One of the propositions Marland et al suggest is that "Principles for designing activities to promote deep-level processing should be determined. Links between types of activities and levels of information processing should be investigated".

It should be pointed out that this applies equally to methods of study and to different media.

3. FREEDOM OF PACE

The subject of pacing in the distance education setting has been reviewed by Shale (1983). He states that "...There is very little data from studies of pacing in distance education..."

As Shale points out reported work on pacing, such as in PSI courses, needs to be treated carefully before extrapolating the results to distance education. As he states "...it can be argued that what is done within a PSI course with respect to pacing is thoroughly confounded with conditions imposed by the larger environment..."

In considering a task-based distance education course such as the Diploma in Agriculture course at Lincoln College pacing presents an interesting application of the subject.

The basic issue is when a student should be assessed for the knowledge component of the task. One end of the spectrum is to ignore when the task is done at the work place and impose a definite return date. The other is to give the students complete control over their learning activity and assessment.

While it must be emphasised that the course is still in the developmental stage the College has opted for this latter position. The student has complete control over the pacing of the learning activity. The alternatives generally adopted by students for a particular learning package and its assessment are:

- * The package is ignored and regarded as irrelevant to their situation/task/state of readiness/motivation.
- * The package is studied immediately and all the assessment tests are done without any relationship of time to the physical task.
- * The package is studied later either - before, during or after the task is completed on the farm.

Now these positions pose problems for administration. One result is that all task assessment is done by computer using a system modelled on CADE used by Hermods (Baath and Mansson, 1977). Another result is that students receive regular postings of assignments every three weeks over a two year period. A significant number of students take 3 years or more to complete a satisfactory number of tasks.

If more resources were available and the developmental phase was complete an open learning system could be used, and some would argue should be used. This would mean students could completely control their own learning activities. They would request the learning packages they wanted at their particular state of readiness and motivation.

It is important to note that the system at Lincoln, may change and follow the pattern seen at Athabasca University. Athabasca started an unpaced operation using the Mastery Model (Block, 1971), but Shale (1983) reports it has now introduced "... a raft of pacing methods". There is a likelihood Lincoln will do the same so that students entering the College for the campus year will have been brought to a similar state of readiness. It is also likely that the completion of certain tasks will be made compulsory.

4. FREEDOM OF ASSESSMENT

The assessment of distance education students has been ably addressed by Connors (1981). He discusses the whole area of assessment under eight questions:

- * Why do we need to assess at all?
- * When should we assess our students?
- * Where should we assess our students?
- * How should we assess our students?
- * Who should set the questions?
- * Who should supervise the actual tests?
- * Who should mark and grade the tests?
- * Who should monitor the system?

In concluding he states "There is a strong case for self-assessment and formal continuous assessment as well as for final assessment."

In the Diploma in Agriculture pre-entry course the whole question of assessment had to be examined from a new perspective. If students were going to be free to pace themselves i.e. unpaced, free to choose learning strategies, media and content, how were they to be assessed?

One of the basic objectives of the pre-entry programme was 'to facilitate a transfer of learning between the Farmer/College/Student'. With this in mind the assessment programme developed to date has been by two methods.

Two methods of assessment are used:

- * Written assessment is made up of two farm reports. These are large reports - usually more than 20 pages. They are graded - the marks do not count towards their final Diploma marks. The comments of the tutors are very important. All of the reports are marked by ex-students of the College currently working in the field.
- * Multi-choice questions. All the learning packages contain a series of task related assessment sheets. Usually there are 4-6 per learning package. Each sheet contains 10 questions with four options within a question.

These are all marked by computer and returned to the student within 48 hours

The system is modelled on that of Liberhermods - CADE (Baath and Mansson, 1977). In other words letters are generated giving the marks and comments about questions where the wrong answer has been chosen.

However the system has a novel aspect. The assessment tests are really an indication that the of learning has taken place. The students are free to do the test:

- under rigorous test conditions
- using an open book policy
- by discussing the questions and answers with the farmer/tutor
- any number of times

While in a developmental phase alternative methods of assessment, although deal, have not been used. Individualised learning would, or should, give a student a choice between

- * assessment methods and also
- * assessment questions

In educational jargon the system used is "criterion-referenced assessment"; each test question carries a criterion or objective with it. Mastery learning does not just make use of criterion-referenced measurement, it incorporates it into an entirely different approach. The distance learning packages are broken into a number of areas of study, each with a definite set of specified objectives. These objectives are closely tied to the psychomotor skills objectives set by the New Zealand Agricultural Training Council for the physical skills domain.

Each area or topic is broken down into a number of tasks each with a number of behavioural objectives. Students can resit tests until they achieve mastery. There is no penalty for the number of times a student sits a test. (In fact the computer wipes the previous record so the College has no record of it.)

Such a testing system is not the norm-referenced tertiary system usually found in educational institutions.

5. FREEDOM OF SEQUENCE

The way material is sequenced in a learning package has not been widely researched in distance education. Individualised learning requires that sequencing of material be done in such a way that the individual can choose how to study that material. Clear signposting, and access structures, such as table of contents, subunits within a learning package, objectives etc. are needed.

Pask (1976), Marton (1975), and Marton and Saljo (1976) have described how individual students learn. Their work gives some indication of the wide variety of strategies students employ in learning. The sequence in which material is often completely different from that set down by the teacher.

CONCLUSION

Individualisation requires a move from teacher-centred to learner-centred programmes. Distance education has potential in providing packages to meet individual needs.

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